REMARKS

The Office Action of August 27, 2004 has been received and its contents reviewed. Prior to the Office Action, claims 1, 2, 5, 7-14, 16, 18, and 20-25 were pending in this application. By this Amendment, claims 1, 5, 13, and 18 have been amended and claim 14 has been canceled. Thus, claims 1, 2, 5, 7-13, 16, 18, and 20-25 are pending for consideration. By the actions above and the remarks below, Applicants respectfully request reconsideration and allowance of all pending claims.

Request for Acknowledgment of Information Disclosure Statement

Initially, it is respectfully requested the that the Examiner provide a copy of the initialed PTO-1449 submitted with the Information Disclosure Statement filed on October 8, 2003 to evidence consideration of the documents cited therein.

Claim Rejections - 35 U.S.C. 112, second paragraph

Claims 1, 2, 5 and 7 to 9 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office asserts that the claims recite that "T is at least one element selected from the group consisting of all transition elements" (for example see claim 1, lines 5 and 6), and that Fe is considered to be optional.

However, claims 1 and 5 have been amended to recite, in part, that "T is Fe and may optionally include at least one element selected from the group consisting of all transition elements". Accordingly, Applicants believe that claims 1, 2, 5, and 7-9 are not indefinite, and respectfully request that this rejection be withdrawn.

Claim Rejections - 35 U.S.C. 103(a)

Claims 1, 2, 5, 7 to 10, 12 to 14, 16, 18, 20 to 23 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura et al. (Fujimura, EPO Document No. 0255939) taken in view of The Condensed Chemical Dictionary. Applicants traverse.

In particular, the Office asserts that Fujimura teaches a sintered rare earth-transition metal-boron magnet having a composition that overlaps the alloy composition recited in

applicants' claims (page 3, lines 45 to 50) containing oxygen in an amount of 10,000 ppm or less (page 6, lines 39), that Fujimura also teaches that the alloy composition contains Co and Al as recited in applicants' claims 13 to 16, 18 and 20 to 25 (page 5, line 50 to page 6, line 11), and that Fujimura teaches that the sintered magnet contains crystal grains having the $R_2Fe_{14}B$ structure and a grain boundary phase composed of an R-enriched phase (page 4, lines 21 to 27 and 33 to 39). Thus, in view of the above discussion, the Office asserts that Fujimura teaches a sintered rare earth-transition metal-boron magnet having a composition that overlaps the composition recited in applicants' claims and which is made by a process which overlaps the process recited in applicants' claims.

In addition, the Office asserts that the condensed Chemical Dictionary teaches that La is a rare earth element while Y is associated with the rare earths and is separated only with great difficulty, that is, for practical reasons Y is considered to be part of the rare earth group of elements.

Moreover, the Office asserts that Fujimura's disclosure of the use of rare earths encompasses Y and La, and that this fact in combination with Fujimura's disclosure of an R-enriched grain boundary phase means that Fujimura's disclosure encompasses an embodiment wherein the grain boundary phase contains more La and/or Y than the $R_2Fe_{14}B$ phase as recited in applicants' claims.

However, claims 1, 5, 13, and 18 have been amended to recite, in part, a rare-earth sintered magnet of composition of $(R1_x + R2_y)T_{100-x-y-z}Q_z$ wherein the molar fraction y satisfies $0.5 < y \leq 3.0$ at%.

In the present invention defined by claims 1, 5, 13, and 18 as amended, oxygen and yttrium (Y) play an important role to diffuse R2 into the grain boundary phase so that a concentration of R2 become higher in at least a part of a grain boundary phase than in the crystal grain. The increase in the R2 concentration in the grain boundary phase can be achieved by limiting the R2 concentration and the amount of oxygen within the claimed narrow range.

According to the claimed invention, Y is diffused from the inside of the crystal grains (main phase) into the grain boundary phase through the sintering process. During the sintering process, an oxide of Y is formed in the grain boundary phase, as illustrated in FIG. 1B of the present application. At this time, Nd is diffused in the opposite direction. As a result, the Y concentration in the grain boundary phase increases to be greater than that in the

crystal grains. Thus, the amount of Y contained in the main phase decreases, as illustrated in FIG. 1C, thereby increasing the magnetization.

In order to realize the mutual diffusion of Y and Nd as described above, an appropriate amount of oxygen needs to be present in the grain boundary phase during the sintering process. This is because the claimed invention causes the diffusion as described above utilizing the fact that Y more stably combines with oxygen to form an oxide than Nd. For such an introduction of oxygen into the grain boundary phase, it is preferred to slightly oxidize the powder particle surface in the pulverization step, for example.

According to the claimed invention, yttrium (Y) is diffused into the grain boundary phase, whereby it is possible to efficiently utilize a rare-earth element, such as Nd or Pr, that is indispensable for the main phase without wasting such an element in the grain boundary phase, thereby maintaining the magnetization of the main phase at a high level and thus providing a rare-earth sintered magnet that exhibits desirable magnetic properties.

In addition, according to the claimed invention, yttrium (Y) is localized in the grain boundary phase, whereby an element (such as Co or Ni) that contributes to improving the magnetic properties in the main phase can be efficiently taken into the main phase without wasting such an element in the grain boundary phase.

Fujimura fails to teach or suggest the above behaviors of yttrium (Y) and oxygen during the sintering process.

In addition, the Office asserts that Fujimura's disclosure of an R-enriched phase means that the grain boundary phase contains more rare earth than the $R_2Fe_{14}B$ phase. As the Examiner correctly pointed out, the R-enriched phase present at the grain boundary and contains more rare earth than the $R_2Fe_{14}B$ phase. However, the concentration of yttrium (Y) in the R-enriched phase is less than that in the $R_2Fe_{14}B$ phase.

As described above, even if the R-enriched phase contains more rare earth than the $R_2Fe_{14}B$ phase, yttrium (Y) does not diffuse from the main phase into the grain boundary phase. As a result, the concentration of yttrium (Y) in the magnets disclosed by Fujimura is not higher in the grain boundary phase than in the crystal grain.

In addition, Fujimura fails to disclose the examples that comprise yttrium (Y). The Examiner states that yttrium (Y) is associated with the rare earths and is separated only with great difficulty. Conventionally, yttrium (Y) is separated from the Nd or Dy in order to obtain rare earth metals for producing rare-earth magnets. In order to add yttrium (Y) in the clamed concentration range, yttrium (Y) should be added intentionally to rare earth metals.

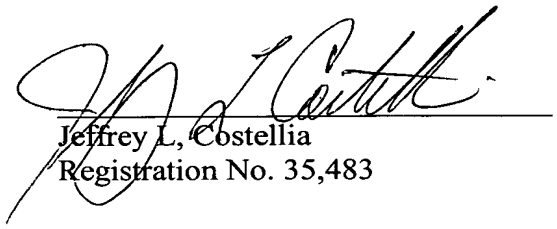
Fujimura fails to teach intentional addition of yttrium (Y). Furthermore, Fujimura fails to teach or suggest limiting the concentration of yttrium (Y) in the narrow range as recited in the claims of the present application.

Accordingly, Applicants believe that claims 1, 5, 13, and 18 are not rendered obvious under 35 U.S.C. § 103(a) by the teachings of Fujimura in view of The Condensed Chemical Dictionary. Furthermore, based on their dependency on claims 1, 5, 13, and 18; claims 2, 7 to 10, 12, 16, 20 to 23, and 25 are also not rendered obvious under 35 U.S.C. § 103(a) by the teachings of Fujimura in view of The Condensed Chemical Dictionary. Therefore, Applicants respectfully request that the rejection of claims 1, 2, 5, 7 to 10, 12 to 14, 16, 18, 20 to 23 and 25 under 35 U.S.C. 103(a) be withdrawn.

In view of the amendments and arguments set forth above, Applicants respectfully request reconsideration and withdrawal of all the pending rejections.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

Respectfully submitted,



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